

# METHOD OF CREATING AUTHORIZED, TAX EXEMPT MUNICIPAL BONDS USED TO REPLACE A LIABILITY WITH INSURANCE

## BACKGROUND OF THE INVENTION

### Field of the Invention

The present invention relates to a method of creating one or more municipal bonds which are used to replace a liability with insurance. The method creates bonds with characteristics increasing the chances of being tax exempt, provides evidence used in obtaining a tax exempt opinion, reduces insurance premium taxes, facilitates approval for bond issuance, and facilitates obtaining favorable bond insurance or bond ratings.

### Description of the Related Art

#### **Tax Exempt Interest on Bond Financing of Insurance**

Bonds issued by a U.S. "state or any political subdivision thereof" are currently exempt from federal income tax, subject to certain significant exceptions. Some exceptions relate to the bondholder. Tax exemption treatment related to the bonds themselves is dealt with in this application. Some factors relating to the tax exemption of a bond issue include: private or public purpose, arbitrage obtained due to borrowing at tax exempt rates, type of issuer, and certain "qualified" types of bonds.

IRS codes relating to tax exemption of interest on state and local bonds are attached for convenient reference: United States Codes, Title 26 (IRS Codes), Sections 103, 141, and 146-149 and the Code of Federal Regulations, Title 26 (IRS Regs), Volume 2, Section 1.148-10.

It is common for states to allow a tax exemption for interest on bonds issued by that state, or public entities within that state. Sample sections from the California Revenue and Taxation Code relating to taxation of bond interest are attached for reference.







Most public offerings of municipal bonds are rated by one or more of bond rating agency, such as Standard & Poors, Moody's, or Fitch. Many privately placed municipal bonds are also rated.

Bond rating agencies have policies regarding ratings which may include how the bond is approved or authorized. In at least one case, a rating agency specifically provides a higher rating for bonds authorized through a validation proceeding than through certain other alternative methods. A copy of \_\_\_\_ from Moody's is attached for reference.

In recent years, about 40% of all municipal bonds have had bond insurance from companies such as AMBAC, FSA, MBIA, or FGIC. These companies are currently rated AAA by the major rating agencies, and their guarantee generally resulting in a AAA rating for a bond and reduces the issuer's interest cost.

Charges for bond insurance generally are related to the bond issuer's underlying credit rating. Bond guarantee firms follow similar approaches to rating agencies, and may provide a lower guarantee fee for bonds approved through a validation proceeding than through other alternative approval methods.

## Definitions

Self insurance: self insurance means setting reserves for a liability rather than purchasing insurance. Self insurance may or may not involve setting aside funds for future payment of liabilities which have been or will be incurred. It includes formal self insurance sanctioned by a regulatory authority such as workers compensation or automobile self insurance.

Uninsured: not covered by insurance. Includes self insured. In many cases, uninsured liabilities are also unknown, such as with hidden underground pollution.

THESE RESEARCH

- 1 Liability: a financial obligation, debt, claim, or potential loss. Many types of
- 2 liabilities are not commonly insured. A few types of liabilities are by law
- 3 uninsurable. For example, punitive damages are uninsurable in many states.
- 4
- 5 Partial insurance: some risks are partially insured. Examples include auto
- 6 insurance with a \$500 deductible, or product liability insurance with a per
- 7 occurrence limit of \$1 million. Portions of a liability which are not insured are
- 8 uninsured and in some cases self insured.
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SUMMARY OF THE INVENTION

An exemplary preferred method according to the present invention includes one or more of the following steps: configuring a bond issue to increase the chance that it will yield tax exempt interest; analysis and documentation of whether a bond is an arbitrage bond; obtaining one or more legal opinions regarding the tax exempt status of the bond; obtaining approval for bond issuance; obtaining one or more bond ratings and bond guarantees; and issuing and making payments on the bond.



DESCRIPTION OF THE DRAWINGS

Other objects, features and advantages of the invention will become readily apparent upon reference to the following detailed description when considered in conjunction with the accompanying drawings, in which like reference numerals designate like parts throughout the figures thereof, and wherein:

FIG. 1 is a high level, functional flowchart embodying of an exemplary preferred system and method according to the present invention;

FIG. 2 is a flowchart showing steps involved designing bond structure to increase chances of being tax exempt;

FIG. 3 is a flowchart showing steps involved in calculating the effect of tax exempt versus taxable interest payments on the bond;

FIG. 4 is a flowchart showing steps involved in obtaining private letter rulings, state tax rulings, or bond counsel tax exemption opinion;

FIG. 5 is a flowchart showing steps involved in approval procedures, such as a California Validation Proceeding;

FIG. 6 is a flowchart showing steps involved in obtaining bond guarantee insurance and obtaining one or more bond ratings;

FIG. 7. is a flowchart showing methods of calculating one or more breakeven interest rates or breakeven term structures for premium financing;

FIG. 8 is a sample output showing cash flows and present values for self insurance versus insurance with bond financing at tax exempt, taxable, and usury borrowing rates, using flat interest rates over the bond term;

FIG. 9 is a summary of taxable equivalent bond yields by state;

FIG. 10 is a sample output showing calculation of breakeven interest rates; and

FIG. 11 is a table showing various liabilities which might be insured.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

An exemplary preferred embodiment of the present invention is adapted to create an index of residual value for groups of automobiles and to create related futures, options, and insurance products.

### **Major Inputs and Outputs**

Referring to FIG. 1, an exemplary preferred system 50 according to the present invention includes a public entity, public authority (such as a port authority or airport authority), pool of public entities, or joint powers authority, 101.

Information from various sources is conveyed to the public entity, public authority (such as a port authority or airport authority), pool of public entities, or joint powers authority, 101. This information includes: pricing analysis and projected savings of using insurance with premium financing instead of self insurance or being uninsured for a liability 103; cash flow projections for self insurance and insurance with premium financing 105; Internal Revenue Service (IRS) codes and regulations 107; bond issuance codes and regulations and debt limit codes and regulations 109; and state tax codes and regulations 111.

Information compiled by the public entity, public authority (such as a port authority or airport authority), pool of public entities, or joint powers authority 101 may be processed and used for filings or inquiries with the IRS and/or a state tax authority 113. The IRS and/or state tax authority may issue one or more rulings related to tax exemption of interest payments on bonds 115. Any such rulings 115 may be used by bond counsel 117 for counsel's tax opinion. Bond counsel 117 also might issue an opinion without any such rulings.

Many bond issues require an approval from outside the public entity, public authority (such as a port authority or airport authority), pool of public entities, or joint powers authority 101. Examples of such approvals are voter approval, state regulator approval, and court validation proceedings 119. Information compiled

by the public entity 101 can be used by the voters, regulators, or courts providing approval 119 in their analysis or decisions regarding the bond issue. When approval is granted 121, such as after completion of a ballot, regulatory procedure, or validation proceeding, a bond guarantee and/or one or more bond ratings may be obtained 123. After any such guarantee or rating is obtained at step 123, one or more bonds are issued to pay for insurance 125.

#### **Bond Structure and Tax Exempt Status**

FIG 2 illustrates steps used to increase chances of a bond used to pay insurance premium being tax exempt. These steps are primarily derived to comply with IRS codes relating to tax exemption of interest on state and local bonds: United States Codes, Title 26 (IRS Codes), Sections 103, 141, and 146-149 and the Code of Federal Regulations, Title 26 (IRS Regs), Volume 2, Section 1.148-10. A copy of these documents is attached for reference. It is common for states to allow a tax exemption for interest on bonds issued by that state, or public entities within that state. Sample sections from the California Revenue and Taxation Code relating to taxation of bond interest are attached.

At step 201 a check is performed to see if the proposed bond is a private activity bond. Private activity bonds are defined under section 141 of the IRS Code. The characteristics of private activity bonds are well known to those skilled in the art of municipal bond legal analysis and issuance. A "yes" at 201 advances to step 203. A "no" at 201 advances to step 205.

In certain defined circumstances which are well known to those skilled in the art of municipal bond legal analysis and issuance, a private activity bond can be a "qualified bond" which is eligible for tax exempt treatment. Qualified bonds are described under sections 141, 146 and 147 of the IRS Code. If the bond is a qualified private activity bond potentially eligible for tax exemption, a "yes" advances to step 205.

Another requirement for state and local bonds to be exempt from Federal taxation is that they be registered. The requirements for bonds to be registered are also well known to those in the field and described in section 149 of the IRS Code. Among bonds required to be registered are those sold to the U.S. public with maturities of one year or more. If the bond is not sold to the public, not sold to anyone in the U.S., or has a maturity of less than one year, a "no" at 205 advances to step 207. Otherwise, a "yes" at 205 advances to step 213.

At 207, a bond in its current expected form is unlikely to yield tax exempt interest. If the insurance with bond financing is still a good deal if taxable, a "yes" advances to step 211. The definition of "good deal" will most likely be at the discretion of the mayor, governor, board, or other governing entity of the bond issuer. In some circumstances, insurance might be a good deal even if it is expected to be **more expensive** than self insurance on average. For example, transfer of catastrophe risk, elimination of a moral hazard, or a legal requirement to fund a liability or purchase insurance might make taxable bonds for insurance a good deal, even if more expensive than the expected cost of self insuring.

At 211 a bond yielding taxable interest is pursued.

A "no" at 207 advances to step 209. If taxable bond financing raises interest expense enough that the currently proposed transaction is not a good deal, at 209 the public entity may decide to stop, and not pursue any transaction. The public entity might also attempt to reconfigure the deal in some way. Examples of **reconfiguring** include, but are not limited to: obtaining less expensive insurance; buying insurance with different limits or policy provisions; buying insurance for a shorter or longer policy term; waiting and including the bond as a qualified private purpose bond in a future year; changing the bond from

unregistered to registered form; changing the term or cash flows of the bond; and waiting for market interest rates to drop.

A "yes" at step 205 advances to step 213, where a check is performed to see if the bond is financing insurance premium which will be paid over multiple years. If portions of the proceeds are kept for too long after the bond is issued, it may be classified as a "hedge bond". The characteristics of hedge bonds are well known to those in the field of municipal bond law and underwriting. Hedge bonds are defined in IRS Code section 149 (g). If insurance premium will be paid over multiple years, a "yes" advances to step 215. A "no" advances to step 217.

For long multiyear insurance policies, such as five years or more, paying premium in equal amounts annually might run afoul of the hedge bond requirement. For example, a large construction project might last 10 years. If a bond was issued to pay workers compensation insurance premiums for 10 years, 10% of the bond proceeds might be used each year to pay premium. In order to avoid hedge bond treatment, at least 85% of the bond proceeds should be paid out within 3 years of the issue date. In some cases, an issuer would do multiple bond issues several years apart to comply with hedge bond requirements. The issuer might also **prepay** an insurance premium to comply with this requirement. In some cases, discounts for prepaying insurance premiums are very substantial, more than would be expected simply due to the time value of money or interest income of the insurance carrier.

At step 217, the bond term is set to be less than or equal to the term of the liabilities insured. This step is not strictly required by any current IRS code or regulation. Thus, this step is not required, but precautionary. There are general cautions about "overburdening the tax exempt market" by issuing bonds far in advance of the first payment from the proceeds (e.g., 1.148-10 of the IRS CFR), or issuing bonds which remain outstanding for longer than necessary.



1 Tax exempt interest rates expected for the bond issue are input in 307. Such  
2 rates might come from a market source for recent bond issues of similar term  
3 and rating. For example, a California public entity with a AA rating from Moody's  
4 seeking a 5 year tax exempt bond might use the interest rate term structure of a  
5 recent 5 year tax exempt bond issued by another AA rated CA public entity.  
6 Other potential sources of tax exempt interest rates include, but are not limited  
7 to: market sources, such as Bloomberg; a recent bond issuance by the same  
8 entity; a U.S. treasury term structure with a tax exempt spread adjustment; a  
9 bond underwriter or investment banker; and the Municipal Market Data Index  
10 (MMD). It is also possible to perform calculations with the term structure set as a  
11 constant flat rate. Flat rates can be supplied by a similar variety of sources to  
12 term structures.

13  
14 Setting the term structure at a constant rate might be more common for  
15 preliminary analysis. In fact, the entire analysis can be done pro forma, with no  
16 actual insurance quote, a tax exempt bond rate which is approximate, a taxable  
17 interest rate which is approximate, and self insurance forecasts which are drafts,  
18 approximate, or uncertain guesses. The quality of the analysis increases with  
19 increased reliability of the inputs.

20  
21 Robustness of savings forecasts can be tested with simulations. Any of the  
22 inputs can be allowed to vary and ranges of savings can be calculated. For  
23 example, simulations can be performed using a range of self insurance costs or  
24 various self insurance cash flow patterns. In cases where insurance with taxable  
25 bond financing shows substantial savings over even low end forecasts of self  
26 insurance costs, this shows substantial support for bonds not being "arbitrage  
27 bonds" and helps the case for tax exempt interest.

Another case where simulations are useful is for bonds with floating interest rates. In that case, simulations over a range of possible or likely interest rates can be performed.

At 309 taxable interest rates for the same term, state and rating as the tax exempt parameters used in 307 are input. Alternatively, approximate expected taxable equivalent interest rates could be calculated from the applicable personal income tax rates of likely buyers of the bond. For example, for the year 2001, a single taxpayer living in California who has a gross income of \$100,000 would have an overall marginal (net state and federal) tax rate of 36.963%. Thus, the expected equivalent yield for a California municipal bond which yields 5% tax exempt is 7.93% taxable;  $7.93\% = 5.00\% / (100\% - 36.963\%)$ . An exemplary table of taxable equivalent yields is in FIG. 9. Note that there are several states which do not currently have state income taxes.

The software program 301 calculates cash flows and present values for: self insurance; insurance with tax exempt bond financing; insurance with taxable bond financing; and a breakeven interest rate 311. The breakeven rate is the interest rate at which the present value of self insurance equals the present value of insurance with bond financing.

The breakeven interest rate can be obtained by multiple methods, including: using simulation, manual iteration by changing the interest rate(s), or by using software tools such as Excel's Solver or Lotus' Backsolver. Both the Excel and Lotus solver tools allow the user to specify the value of a particular cell and vary the values in certain other cells to obtain the specified value. For the breakeven rate, a cell containing the calculation of net savings of the present value of insurance with bond financing versus the present value of self insurance is set to zero. Then, other cells containing one or more interest rates are allowed to vary. One straightforward method of using the solver with a term structure of interest





1 If the breakeven interest rate is higher than the applicable usury rate, or is higher  
 2 than usury rates for other borrowers or jurisdictions, a "yes" at 313 advances to  
 3 step 317. At 317 documentation is created showing that interest rates high  
 4 enough to make insurance with bond financing a breakeven deal with self  
 5 insurance requires interest rates which are illegal, or are illegal for some  
 6 borrowers or jurisdictions.

7  
 8 A "no" at step 313 advances to step 319. A 319 a check is performed to see if  
 9 the present value of insurance with taxable bond financing is less expensive than  
 10 the present value of self insurance. If the present value of insurance with bond  
 11 financing is lower, this is support that the proposed tax exempt financing does  
 12 not "overburden the tax exempt market" and a "yes" advances to step 321. At  
 13 321, documentation is created showing that at taxable interest rates, the entity  
 14 would still save money by using insurance with taxable bond financing, instead of  
 15 self insurance.

16  
 17 A "no" at step 319 advances to step 323. At 323, the entity may review legal  
 18 requirements for purchasing insurance, changes in the law, risk reductions  
 19 obtained through insurance, possible changes to the insurance deal or bond  
 20 financing, or any other changes which might justify tax exempt bond financing.

21  
 22 **Obtaining One of More Opinions Relating to Tax Exempt Status of a Bond**

23 FIG. 4 is a flowchart showing methods of obtaining one or more legal opinions or  
 24 rulings related to tax exemption of interest on bonds used to pay for insurance  
 25 premium.

26  
 27 Information from various sources is conveyed to or assembled by the public  
 28 entity, authority, pool, or joint powers authority, and their counsel 401. The  
 29 information includes: Internal Revenue Service Codes, for example Title 26,  
 30 Sections 103 and 141-149, input 403; Internal Revenue Service Regulations, for



"yes" at 419 advances to 421, where an opinion or ruling regarding tax exemption at the state level is sought and then the process continues at 423.

Bond counsel's completed legal opinion is output as a document at 425. This document is likely to become part of the bond official statement. Bond counsel opinion is also frequently used for other purposes such as: approval processes, seeking bond guarantees, and/or seeking bond ratings. Bond counsel opinion might also be included in briefs for any validation proceedings.

### **Bond Validation Proceedings**

FIG. 5 is a flowchart showing methods of obtaining validation for a bond issuance through a court validation proceeding. Validation proceedings are used in some states to confirm the validity of proposed bond issues. In some states, these are referred to as "validation procedures", or "validating proceedings" rather than "validation proceedings". Among the states using validation proceedings are: California, Florida, Georgia and Utah. Validation proceedings enable public entities to confirm the legality of various actions, including contractual agreements and the issuance of public debts. Validation proceedings help avoid litigation relating to a bond issue. In many cases, they also help avoid debt limitations, or help obtain a favorable bond rating (see FIG. 6).

Information from various sources is conveyed to or assembled by the public entity, authority, pool, or joint powers authority, and their counsel 501. The information includes: the proposed insurance program which will be financed by the bonds, which may be for any type of insurance for past occurrences or future liabilities, input 503; documentation of improved guarantee of claim payment, such as might occur when the credit risk of a public entity is replaced by the credit risk of an insurer, or an insurance guarantee fund, input 505; a debenture, a certificate or voucher acknowledging a debt, and stating whether the debt is imposed by law, and any applicable debt ceilings, input 507; a summary of the







1 by appearing and filing a written answer to the complaint not later than the date  
2 specified in the summons, which date shall be 10 or more days after the  
3 completion of publication of the summons. " (California Code of Civil Procedure,  
4 Section 861-861.1).

5  
6 A second form of summons may or may not be present. The court may direct, or  
7 the public entity may choose, that certain relevant or indispensable parties be  
8 served directly. Such parties are generally parties which are expected to have  
9 an interest in the matter before the court. In the example of a bond issue to pay  
10 workers compensation premium, parties which might be served directly include:  
11 labor unions for employees of the public entity; a state self insurance regulator;  
12 or vendors involved in the current self insured program.

13  
14 In a large percentage of validation proceedings, no one files opposing briefs or  
15 contests the validation proceeding. At step 523, if any opposing briefs are filed,  
16 these are responded to. In some cases, the public entity might also make  
17 changes in their briefs and ask the court to validate the modified briefs.

18  
19 At step 525, the waiting period for filings expires. This filing period lasts 60 days  
20 from the public entity's filing with the court. The court rules on the matter before  
21 it. In many cases, unopposed validation proceedings result in judgments which  
22 are virtual copies of the public entity's briefs.

23  
24 Regardless of whether there was any opposition, there is a 30 day appeal period  
25 for the judgment at step 527. After the appeal period expires, the judgment of  
26 the court is final and the court issues a ruling validating matters relating to the  
27 bond issue for insuring one or more liabilities at 529.

28  
29 After final judgment on the validation proceedings, it is extremely difficult to  
30 appeal any finding of the court: " The judgment, if no appeal is taken, or if taken



and the judgment is affirmed, shall, notwithstanding any other provision of law including, without limitation, Sections 473 and 473.5, thereupon become and thereafter be forever binding and conclusive, as to all matters therein adjudicated or which at that time could have been adjudicated, against the agency and against all other persons, and the judgment shall permanently enjoin the institution by any person of any action or proceeding raising any issue as to which the judgment is binding and conclusive" (California Code of Civil Procedure, Section 870).

#### **Obtaining One or More Bond Ratings, Obtaining a Bond Guarantee**

FIG. 6 is a flowchart showing steps involved in obtaining any bond guarantee insurance and obtaining one or more bond ratings.

Information from various sources is conveyed to or assembled by the public entity, authority, pool, or joint powers authority, and their investment bankers or counsel 601. The information includes: the court ruling from any validation proceedings, input 603; the entity's current budget and financials 605; a statement of sources and uses of funds relating to the bond issue 607; a draft of the bond official statement 609; savings, cash flows, arbitrage analysis or simulations, relating to self insurance and insurance with bond financing, such as might be produced from the process in FIG. 3, input 611; a summary of the entity's currently outstanding debts 613; and a bond counsel opinion and any IRS private letter ruling or state income tax rulings, input 615.

There are several interesting uses of funds which could result from the transaction which might be described in step 607. In many cases, a public entity will have partially funded for future liabilities and those liabilities will be covered by insurance paid for by the bond issue. The funds previously set aside could be used to pay a portion of the insurance premium. Alternatively, the funds set

aside could be used for some other purpose (sometimes referred to as "raiding" of funds).

The other use of funds originally set aside to pay for liabilities which will be insured might be related to the original liabilities. For example, the insurance being purchased might be for earthquake coverage with a \$100 million limit. Funds previously set aside for that purpose might go to a reserve to cover losses over \$100 million, or might be used for earthquake mitigation. Less related uses might be for other risks, such as general liability or workers compensation, or for uninsured and previously unfunded pollution liabilities. Lastly, funds might be used elsewhere for completely unrelated purposes, such as road construction, employee salaries, or balancing the public entity's overall budget.

If the funds previously set aside are being used "responsibly" in the view of rating agencies, it may help obtain a better rating for the bonds. If the funds are merely being "raided" to show a balanced budget in the current year, the rating agencies may see this as a sign of poor management or future problems balancing the budget and issue a lower rating.

In recent years, about 40% of all municipal bond issues sold in the U.S. have been guaranteed by companies such as FSA, AMBAC, and FGIC. The guarantee of payment from a company rated AAA reduces interest expense for the public entity issuing the bond. Some bonds are submitted for review for guarantees and either declined by the guarantee company or the entity elects not to accept the guarantee offer, for reasons such as pricing of the guarantee fees. Bond guarantee underwriters collect information similar to that obtained by bond rating agencies. At 617, a choice is made regarding whether to submit information to one or more bond guarantee underwriters. The processes of bond guarantee underwriting and evaluating offers from guarantee firms are well



1 Any bond guarantee insurance will have a substantial effect on the rating of the  
2 bond issue; generally the issue will receive the rating of the firm providing the  
3 bond guarantee.

4  
5 At step 629 bond ratings are issued by one or more bond rating agencies. These  
6 ratings, and the tax exempt status of the bonds, are likely to be prime  
7 determinants of interest costs for the bond issuer. Bond ratings are generally  
8 included in the bond official statement and in other marketing information for the  
9 bonds.

10  
11 At step 631 the bonds are issued. Such bonds might be privately placed, or  
12 might be sold to the general public. Part or all of the proceeds of the bonds are  
13 used to pay insurance premiums; one or more insurance carriers accept one or  
14 more premium payments and provide coverage. Portions of the bond issue  
15 might go to pay other expenses including, but not limited to: underwriting fees,  
16 brokerage fees, premium taxes, bond counsel, financial consultants, filing fees,  
17 patent fees, marketing fees, bond guarantee insurance, surety fees, purchase of  
18 other securities as investments until later premium payments are made, safety,  
19 loss control, and claims administration.

20  
21 At step 631 part of the funds used to pay insurance premium may come from  
22 other sources. For example, many public entities have partially funded for  
23 workers compensation losses which have already occurred. The bonds could  
24 pay a portion of insurance premiums and funds previously set aside could also  
25 pay a portion of premiums. Portions of the premium may be paid over time. For  
26 example, a single bond issue might pay premium for three years of medical  
27 malpractice coverage and make payments at the beginning of each fiscal year for  
28 that year's coverage.

29  
30 **Calculation of Breakeven Interest Rates**

FIG. 7 is a flowchart showing methods of calculating one or more breakeven interest rates or breakeven term structures for premium financing. The process in FIG. 7 may be used on its own, or to aid in another process such as step 311 in FIG. 3.

The system 700 includes a computer executable program which in a preferred embodiment is a spreadsheet program 701 such as a Lotus or Excel spreadsheet containing the software which manipulates the input data. It is technically possible to perform these calculations with a handheld calculator, or even paper and pencil. However, hand calculations would be extremely laborious in many cases and are not a preferred embodiment.

Information regarding losses, forecast losses, and forecasts of cash flows for the liabilities if such liabilities were self insured or uninsured is input in 703. A common source of this information is an actuarial study.

The cost of insuring the liability and insured program using bond financing are input in 705. Input 705 also contains at least one proposed bond payout pattern. Examples of such patterns include: level bond payments for a particular number of years (e.g., 10 equal payments); level bond payments where the amount of each payment is fixed, and the number of payments vary (e.g., \$1 million per year for as many years as is required to pay off the bond); a percentage savings from the forecast expenditures under self insurance (e.g., 11.3% less than self insurance in each and every year); and a fixed dollar amount savings from the forecast expenditures (e.g., \$2.7 million less than self insurance each year).

Tax exempt interest rates expected for the bond issue are input in 707. Such rates might come from a market source for recent bond issues of similar term and rating. For example, a California public entity with a AA rating from Moody's seeking a 5 year tax exempt bond might use the interest rate term structure of a





The method of calculation of breakeven interest rates is similar for fixed and floating rate bonds. Simulations based on changes in market interest rates are especially useful for floating rate bonds.

At step 719 a choice is made about performing another scenario. For example, another scenario might use different interest rates or a different payout pattern. Alternative scenarios might also contemplate using a call option on the bonds, or using floating interest rate debt. Possible scenarios have a virtually limitless variety. A "yes" at 719 returns to step 711, where breakeven calculations are repeated for another scenario. A "no" advances to step 721. At 721 the process may continue to another process which uses the breakeven data such as step 313 of FIG. 3, or the analysis may stop.

#### **Sample Cash Flow Exhibit**

FIG. 8 is a sample output showing cash flows and present values for self insurance versus insurance with bond financing at tax exempt, taxable, and usury borrowing rates, using flat interest rates over the bond term. In this example, very large savings are expected from insuring the currently self insured liability. Such savings could come from many sources and might vary with the liability or liabilities being insured. Some examples of sources of savings include: safety, loss control, ergonomics, loss prevention, claims administration, medical management, litigation management, arbitration, preferred provider networks, fraud reduction, cash flow management, reduction in fines and punitive damages, contractual transfer of liabilities, and reduction of punitive damages through arbitration.

In many cases, a large percentage of the self insured cost could be saved by moving to insurance. Some public entity self insured programs are very poorly run. In other cases, such as environmental liabilities, the public entity may not be managing a liability at all, or even know it exists. For example, in a number of



cases, public entities have attempted to minimize or deny the existence of pollution at particular sites and during the period of denial cleanup became more expensive because pollution spread and contaminated a larger area.

While the example in FIG. 8 shows a situation where savings are obtained in each and every budget year, savings will frequently be evaluated on the present values of various alternatives. In many cases, a favorable alternative will result in higher payments than self insurance in at least period. A trivial example is paying an insurance premium in cash up front without bond financing instead of staying self insured and paying a much larger liability over many years.

#### **Taxable Equivalent Bond Yields by State**

FIG. 9 is a summary of taxable equivalent bond yields by state. These yields are calculated by setting the aftertax yield of a bond paying taxable interest equal to the yield of a bond paying tax exempt interest. For example, for the year 2001, a single taxpayer living in California who has a gross income of \$100,000 would have an overall marginal (net state and federal) tax rate of 36.96%. Thus, the expected equivalent yield for a California municipal bond which yields 5% tax exempt is 7.93% taxable;  $7.93\% = 5.00\% / (100\% - 36.96\%)$ . Since state income taxes are deductible from federal income taxes for most high income taxpayers the net tax rate in this example is calculated as: Net Overall Marginal Tax Rate = Federal Marginal Tax Rate + State Marginal Tax Rate \* (100% - Federal Marginal Tax Rate), or  $30.50\% + 9.30\% * (100\% - 30.50\%) = 36.96\%$ .

#### **Sample Breakeven Interest Rate Calculations**

FIG. 10 is a sample output showing calculation of breakeven interest rates. For FIG. 10, the interest rates for discounting self insurance and bond payments were both set at a flat 5%, regardless of term. In this example, undiscounted self insured losses are expected to be \$100,000,000, paid over a period of 25 years, shown on line 1. Discounted at 5%, and assuming payments spread

1 equally across any given year, the present value of self insurance is  
2 \$82,879,803, on line 3. Because losses in later years are small, they have been  
3 consolidated to a single column showing losses in year 12 and later. The PV  
4 factor for the "Year 12+" adjusts for the actual timing of the cash flows for later  
5 years, as shown on line 2.

6  
7 In the two bond scenarios in FIG. 10, savings from insurance are substantial, and  
8 the cost of insurance, plus other fees such as bond issuance and premium taxes  
9 is \$45,953,272, line 4. The selected payout pattern for the bond in Scenario A is  
10 a flat 10 year payout with payments at the middle and end of each year and  
11 totals 58,785,731, line 5. Payments at the middle and end of each year lead to  
12 slightly different discount factors at 5% than for self insurance, where payments  
13 are assumed to be made evenly throughout the year, line 8.

14  
15 Using the self insurance present value of \$82,879,803 as a target, the interest  
16 rate on the bonds was varied in iterations to obtain the interest rate where bond  
17 principal and interest payments discounted at 5% are exactly \$82,879,803 on line  
18 9: the breakeven rate. The breakeven interest rate for this scenario is  
19 20.4227833%, line 10. Breakeven bond payments are in line 7.

20  
21 For shorter bond financing periods, the breakeven interest rate will be higher  
22 than the same payout pattern for longer periods. Using the previous example,  
23 but a 5 year bond financing period, the breakeven rate is over 34%.

24  
25 Scenario B shows a more complex calculation for a bond with a 10 year term, but  
26 with annual payments calculated to be in proportion to the expected payout  
27 under self insurance. In Scenario B, interest rates have a term structure, line 12,  
28 rather than the flat interest rates of Scenario A. Principal and interest using the  
29 expected tax exempt term structure is \$53,022,866, line 13.

To obtain the breakeven term structure, interest rates are varied in proportion to the tax exempt term structure in line 13 until the present value of principal and interest payments in line 18 is exactly equal to the present value of self insurance payments in line 3, \$82,879,803. For this payment pattern, bond principal and interest totals \$97,410,339, line 15. Note that for a different payment pattern, the principal and interest totals would be different.

With this particular payment pattern, the bond payout (10 years) is shorter than the self insurance payout (25 years). Thus, the bond payout is 7.2% higher for each of the 10 years than self insurance payments in the same year, line 16.

Because bond payments are made at the middle and end of each year, PV factors for the bonds in Scenario B line 17 are the same as in Scenario A line 8. In order to get the target \$82,879,803 present value of bond payments in Scenario B, the interest rates in the term structure in line 12 were changed in iterations. If all interest rates in the term structure are increased by a factor of 6.8151784 in line 19, the target \$82,879,803 present value of bond payments is attained. The term structure of bond interest rates for the breakeven calculation is in line 20. Interest rates in line 20 are 6.8151784 times the size of expected tax exempt interest rates in line 12.

There are alternative ways of increasing interest rates to arrive at a breakeven term structure. One alternative is to add the same number of basis points to each interest rate until the target value is attained. If Scenario B is rerun using this method, all interest rates in the term structure must rise by equal amounts to reach the breakeven target, about 2600 basis points in this case.

### **Listing of Insurable Liabilities**

FIG. 11 is a table showing various liabilities which might be insured, such as workers compensation, medical malpractice, pollution liability, general liability

1 and earthquake. Other liabilities might also be insured; the list in FIG. 11 is not  
2 intended to be all-inclusive, but rather representative of the breadth of types of  
3 liabilities.

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